



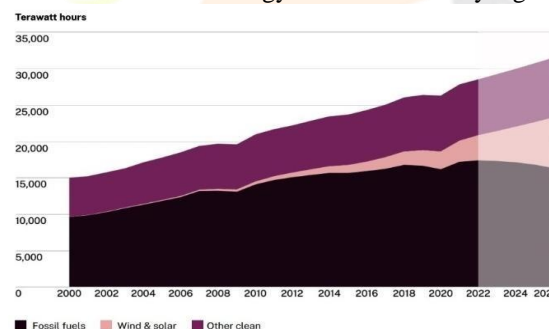
# ENERGY TRANSITION: A MAJOR TURNING-POINT

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## 1. Introduction to energy transition

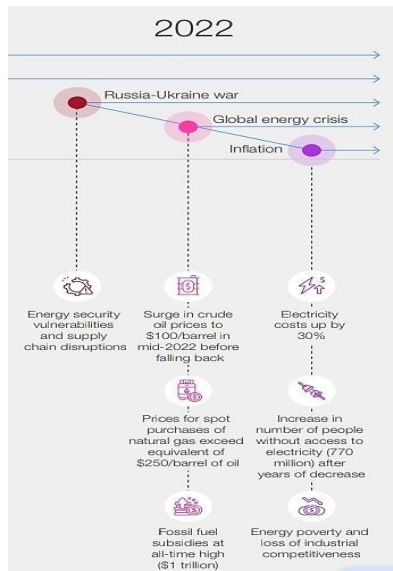
Energy transition is a change in the supply and consumption of energy from non-renewable sources to the renewable sources of energy that are sustainable to use. With power as the prominent source for the CO<sub>2</sub> emissions (~ 35%) moving power generation from fossil fuels (including coal, petroleum and natural gas) to renewable sources of energy is the leading objective of the energy transition. Growth spurt in the usage of wind and solar energy in the upcoming years on a global level diminishes the share of fossil fuels. It is a means of progressing industry, leading to the development of new energy generation resources as non-renewables became scarce over the period of time. Even as the global energy transition has reached a state of little change due to equity issues, major economies are showing tremendous advancement. Transforming the fossil-fuel based energy system to one that is sustainable and decarbonized is one of mankind's greatest challenges of all time. Around 90% of all the energy used comes from fossil fuels, which release polluting gases into the air. Nuclear power as an alternative produces dangerous radioactive waste. Hydroelectric power is the only form of renewable energy that is used in any significant amount.



**Figure 1: Chart showing the growth of wind and solar energy in global electricity production. "Other clean" includes nuclear plants and hydroelectric generation**

## 2. Ukraine war and COVID-19

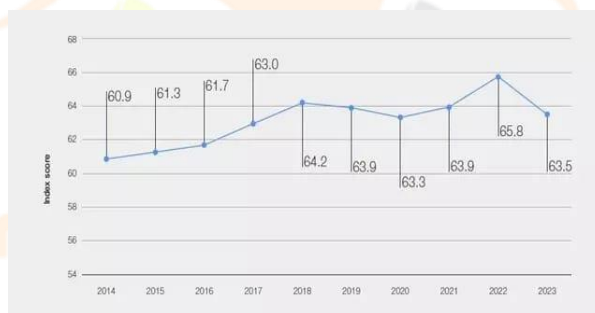
Due to massive energy crisis caused by the war in Ukraine began on Friday, Feb. 24, 2022 energy transition finally came into the focus of policymakers and the leading authorities in recent years. Then came in mid-2020, COVID-19 was having a huge impact on global emissions. Restricted travel and economic activity have driven a 10% decline in CO<sub>2</sub> levels. Result in relying on lower-cost renewables for a greater share of electricity generation. Moreover, the 2015 Paris agreement, which set the goal of keeping temperature increases < 2°C by 2050, has provided a roadmap for countries and industries looking to combat climate change and adapt to its effect. Till now, 1000+ companies have committed to science and tech based objectives to align strategies with the Paris Agreement.



**Figure 2: Volatile period in the energy transition during Russia-Ukraine war, 2022.**

**3. Affordability and economic development**

The importance of the equitable energy transition has crucial impact on the world socio-economic conditions. Energy transition has the ability to form whole new economic opportunities, it could become expensive and inequalities if not managed in a judicious manner. Particularly in developing nations, to flourish the growth spurt while ensuring access to abundant and varied form of energy at cheapest affordable price. The Energy Transition Index (ETI) which benchmarks 120 countries on their present energy outgrowth. Globally since 2014, the score for the equitable dimension has seen a 4% increase, with a current 3% increase from 2021 to 2022 and a 4% decline from 2022-23 as shown in Figure 3.



**Figure 3: ETI equitable dimension trend, 2014-2023**

**4. Global CO2 emissions**

Presently, processes related to extracting, transporting and processing hydrocarbons emit over 5 GT of CO2 each year. That could increase to 7 GT by 2050. The technology involved to sustain near net-zero emissions of CO2 and methane as well. Policymakers can spurt the transition to replace existing sources of energy, demand and supply with comparatively cleaner and zero-emission alternatives. In the oil and gas sector, decarbonization is currently driven by consumers and stakeholder pressure for demonstrated carbon and methane emission declination in a large proportion. Moreover, many giant MNCs have already invested in clean and zero-emission energy through renewables and improved technological aspects. It is evidently an imperative requirement as global temperatures are expected to rise and natural calamity may become more severe, worse and often.

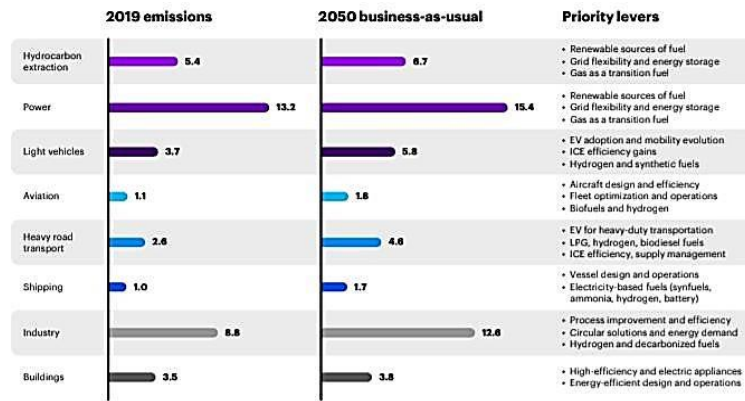


Figure 4: Global CO2 emissions by sector (gigaton CO2 equivalent)

### 5. Commercialization of new technologies

Technologies that can enhance the net-zero emission comprise of use of renewables and electrification technologies. Invest in new-age tech for generating the energy from wind, solar, biomass/biofuels, geothermal energy, tidal and wave energy and green-fuel hydrogen. Along with, improve technologies to help electrify transportation and infrastructure.

Declining prices of energy storage have improved the accessibility and availability of wind and solar form of energies. As businesses, corporates and households continue to adopt increasingly energy-efficient technologies, still the global economy would take less energy to produce each unit of Gross Domestic Product (GDP). In recent years, greater consensus and contradictions has been seen among various scientific, political and business communities worldwide to control the greenhouse gas emissions.

Therefore, a little bit of challenges to face and the road ahead!

### 6. Ethanol Blending and Green Energy

As it is clear, excessive use of fossil fuels leads to high carbon emissions. By using alternatives like ethanol which is one of the prime form of biofuels. It is naturally prepared via the fermentation process or petrochemical processes such as ethylene hydration. It can also be formed from common crops like corn, sugar cane and potatoes. It can be one of the prominent ways to tackle the challenges and concerns related to the energy security and so-called “independence. Ethanol-blended fuel is widely used in Brazil, U.S., and European nations. In most of the nations, majorly oil consumed is imported (including India as well), the shift from oil-based fuels to ethanol produces a better pathway for energy security.

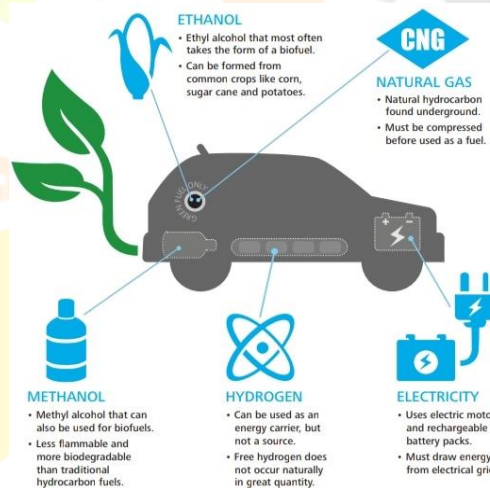


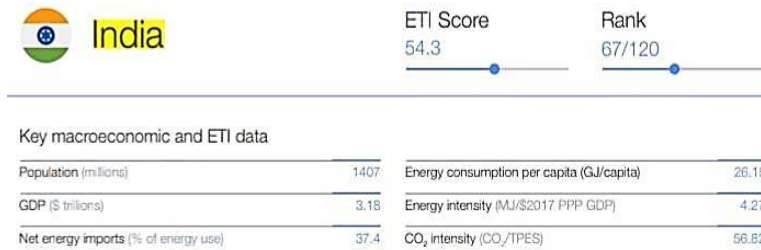
Figure 5: Potential ways to power the car of the future.

### 7. Impacts on biodiversity

According to a data, about 22% of emissions can be attributed to land and food production. Minimizing these emissions is closely connected to maintaining and restoring biodiversity. It tends to protect the world’s enormous amount of flora and fauna and other living organisms too. Nowadays, Investors and corporates are also initiating to put a halt on companies to eliminate suppliers that don’t protect the natural environment. Dark chocolate, lamb and mutton, beef and coffee contributed to the CO2 emissions per kilogram in a dramatic manner. What we eat affects our plant’s future- especially meat consumption.

### 8. Scope and plans in India

One of the most prominent developing nation and an emerging economy as well India has its own set of objectives for the upbringing of the new technologies. Tesla motors, has declared plans to begin its operations in India in the field of electric vehicle (EV). Many companies are also investing in active participation and development of sustainable energy in India. The research in India has started to decrease the dependence of Lithium-ion batteries on china. Pollution is the biggest concern in the present time for the India.



**Figure 5: Energy Transition Index (ETI) data 2023.**

**Note:** GJ= gigajoule; MJ= megajoule; PPP= Purchasing power parity

India's national capital and economical capital Delhi and Mumbai are respectively among the world topmost polluted cities. The biggest cause behind the growing pollution is fossil fuel usage. Fortunately, plans such as National Mission on Transformative Mobility and Battery Storage (2019), Faster Adoption and Manufacturing of Hybrid and Electric Vehicles-FAME INDIA 2015 are effectively working in their respective domains.

## 8. Conclusion

To prioritize the remaining oil and gas resources in a best possible way, encouraging sustainable development for the upcoming generation, nuclear power and expansion renewable energy sources, all make good sense from a variety of economic and policy perspectives.

World leaders are establishing plans and whole new set of idea to complement clean and green energy innovation. Globally, new technology has made the best possible use of wind as a source of energy which complements solar power generated by day.

Substantial development has already been made in the energy transition, but it may be too soon to say the disruption of the pandemic and other economic calamity will shape the future of energy in what sense. But fortunately, acceptance of digital and other technologies for energy efficiency and decarbonization has been accelerated.

## 9. REFERENCES

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